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# *A List of Probably New Double Stars.* By R. T. A. Innes.

During the last two months whilst I had the loan of a telescope belonging to Mr. W. F. Gale, of Sydney, I came across the double stars in the following list, all of which I believe are new. The telescope had a 6¼-inch object glass, made by T. Cooke, York, 1851, and was mounted on a rough equatorial without circles. The eyepiece used gave a power of about 360. I puzzled out the stars found, with the help of Proctor's smaller Atlas and Stone's Cape Catalogue, with fair success, but I generally add a note in reference to neighbouring stars, which will render the identification easier. The positions are for 1900. Angles, &c., are estimations. This list, the result of about thirty hours' searching, will prove what a mine of wealth awaits the diligent double-star observer in the southern hemisphere.

On account of the difficulty of identifying stars I confined my search to the neighbourhood of naked-eye stars, and only registered those which required some attention to notice their duplicity. None of these stars are in Herschel's or the Sydney Observatory lists.

| | | | | |
|---|---|---|---|---|
| G 1 | Stone 1830 | $4^{\rm h}\ 14^{\rm m}{\cdot}8$ | $-61°$ 12′ | |
| 1894·8 | 300° ± | 0″·8 ± | 5½ and 7 | 2n |

| | | | | |
|---|---|---|---|---|
| G 2 | $\xi$ Pavonis | $18^{\rm h}\ 14^{\rm m}{\cdot}0$ | $-61°$ 32′ | |
| 1894·8 | 170° ± | 4″·0 ± | 5 and 10·7 | 2n. |

Detected by Mr. Gale with his 8½-inch, previously to my seeing them.

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|---|---|---|---|---|
| No. 1 | $\lambda^1$ Toucanæ | $0^{\rm h}\ 49^{\rm m}{\cdot}4$ | $-63°$ 25′ | |
| 1894·9 | 90° ± | 3″ ± | 6 and 8·5 | 1n. |

This star is marked double in Proctor's smaller Atlas, whilst $\lambda^2$ *Toucanæ*, a double discovered by Dunlop, is not so marked. Professor Auwers in his proposed list of southern standard stars also overlooked the duplicity of $\lambda^2$.

| | | | | |
|---|---|---|---|---|
| No. 2 | St. 1746 | $4^{\rm h}\ 1^{\rm m}{\cdot}1$ | $-59°$ 51′ | |
| 1894·9 | 90° ± | 2″ ± | 7·5 and 9 | 1n. |

The S star of a small finder pair making a right angle with $\epsilon$ and $\iota$ Reticuli :

| | | | | |
|---|---|---|---|---|
| No. 3 | St. 2879 | $6^{\rm h}\ 11^{\rm m}{\cdot}5$ | $-61°$ 27′ | |
| 1894·8 | 350° ± | 0″·8 ± | 6·5 and 7 | 2n. |

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| | | | |
|---|---|---|---|
| No. 4 | St. 3041 | $6^{h}\ 27^{m}\cdot4$ | −40° 22′ |
| 1894·9 | 340° ± 1″ ± | 6 and 6·1 | 2n. |

The leading star of an oblong of six as seen through the finder.

| | | | |
|---|---|---|---|
| No. 5 | St. 3148 | $6^{h}\ 36^{m}\cdot9$ | −61° 27′ |
| 1894·9 | 270° ± 1″·7 ± | 6·5 and 8·5 | 2n. |

| | | | |
|---|---|---|---|
| No. 6 | St. 3213 | $6^{h}\ 43^{m}\cdot5$ | −61° 7′ |
| 1894·9 | 230° ± 1″·1 ± | 7·8 and 7·8 | 2n. |

| | | | |
|---|---|---|---|
| No. 7 | St. 3567 | $7^{h}\ 14^{m}\cdot6$ | −46° 49′ |
| 1894·9 | 220° ± 1″·5 ± | 7 and 9·5 | 1n. |

Both orange. The fourth star of five in a sickle—

| | | | |
|---|---|---|---|
| No. 8 | St. 4085 | $7^{h}\ 59^{m}\cdot2$ | −44° 23′ |
| 1894·9 | 320° ± 4″ ± | 6 and 10 | 1n. |

| | | | |
|---|---|---|---|
| No. 9 | St. 4287 ? | $8^{h}\ 15^{m}\cdot9$ | −73° 30′ |
| 1894·8 | 280° ± 0″·9 ± | 6 and 7 | 1n. |

An eleventh mag. star 1′ N *f*.

| | | | |
|---|---|---|---|
| No. 10 | δ Argûs | $8^{h}\ 41^{m}\cdot9$ | −54° 20′ |
| 1894·9 | 180° ± 3″ ± | 2·5 and 5 | 2n. |

As this star is much more difficult than *Antares* (2″·8), the distance is probably overestimated. Herschel noted a faint companion 80″ away.

| | | | |
|---|---|---|---|
| No. 11 | St. 4939 | $9^{h}\ 11^{m}\cdot6$ | −45° 8′ |
| 1894·9 | 270° ± 1″ ± | 6·5 and 7 | 1n. |

| | | | |
|---|---|---|---|
| No. 12 | St. 5008 | $9^{h}\ 17^{m}\cdot6$ | −74° 28′ |
| 1894·8 | 290° ± elongated | 5 and 6 | 1n |
| 1894·9 | Round, good seeing | | 1n. |

This is the chief star of the triple *h* 4206.

| | | | |
|---|---|---|---|
| No. 13 | St. 5534 | $10^{h}\ 7^{m}\cdot0$ | −68° 11′ |
| 1894·9 | 340° ± 1″ ± | 7 and 7 | 1n. |

Both white. This is the brightest of the stars ϖ *Argus*, and is N from it.

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No. 14 Anon. $12^{h}\ 6^{m}$ ± $-51°\ 35'$ ±

1894·9 140° ± $3''$ ± 7 and 9·5 1n.

Not in Stone's Catalogue. Just N of ρ *Centauri*.

No. 15 St. 8844 $16^{h}\ 10^{m}{\cdot}7$ $-64°\ 24'$

1894·8 300° ± $0''{\cdot}8$ ± 7 and 9 2n.

R 275, a coarse ninth mag. pair is about 5′ N *p*.

No. 16 St. 2674 $5^{h}\ 49^{m}{\cdot}5$ $-38°\ 33'$

1894·9 110° ± $1''$ ± 6 and 10 large star, orange, 1n.

The brightest star in finder S of η *Pavonis*.

No. 17 St. 11035 $20^{h}\ 37^{m}{\cdot}8$ $-50°\ 51'$

1894·8 210° ± $1''$ ± $7\frac{1}{2}$ and $7\frac{1}{2}$ 2n.

This makes a small triangle with some other 7 mag. stars near ι and η Indi. It is a coarse double 7 and 7, 90° ± 100″ ±, and the preceding star is the close double.

No. 18 St. 11109 $20^{h}\ 48^{m}{\cdot}0$ $-53°\ 58'$

1894·8 0° ± $5''$ ± 7 and $11\frac{1}{2}$ 2n.

The chief star is red. If a line is drawn from α Indi through η Indi, two stars will be found on it. S of η Indi, this is the second star.

No. 19 Anon. $21^{h}\ 41^{m}$ ± 66° 10′ ±

1894·9 A and B 350° ± $0''{\cdot}8$ ± 7·8 and 10 1n

A and C 290° ± $10''$ ± 12 1n.

Very delicate ; about 1° S. of St. 11489.

No. 20 St. 11660 $22^{h}\ 9^{m}{\cdot}3$ $-63°\ 50'$

1894·9 320° $0''{\cdot}6$ 6·5 and 7 1n.

Midway on a line joining α and δ *Toucani* will be found St. 11673 : this star is N *p*.

No. 21 St. 11835 $22^{h}\ 36^{m}{\cdot}6$ $-47°\ 43'$

1894·9 140° ± $5''$ ± 6 and 11·5 1n.

Chief star orange. This and *h* 5362, a star of the same style, but easier, are both near β *Gruis*.

No. 22 $\tau^{2}$ Gruis $22^{h}\ 49^{m}{\cdot}5$ $-49°\ 0'$

1894·9 200° ± $0''{\cdot}6$ ± 6·5 and 8·0 3n.

Only elongated, but quite certain. $\tau^{2}$ *Gruis* is 90″ N. of St. 11933.

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| | | | |
|---|---|---|---|
| No. 23 | St. 12156 | $23^{h}\ 22^{m}\cdot6$ | $-56^{\circ}\ 59'$ |
| 1894·9 | $320^{\circ}\pm\ 1''\pm$ | 8 and 10 | 2n. |

| | | | |
|---|---|---|---|
| No. 24 | St. 12192 | $23^{h}\ 27^{m}\cdot9$ | $-57^{\circ}\ 35'$ |
| 1894·8 | $220^{\circ}\pm\ 2''\pm$ | 6·5 and 9 | 3n. |

This star is 90″ N. of another 6·5 mag. star.

| | | | |
|---|---|---|---|
| No. 25 | Anon. | $23^{h}\ 29^{m}\pm$ | $-58^{\circ}\ 14'\pm$ |
| 1894·9 | $50^{\circ}\pm\ 1''\pm$ | 7·8 and 7·8 | 1n. |

Near St. 12192; in the telescope field this is the preceding star of an elongated cross.

| | | | |
|---|---|---|---|
| No. 26 | St. 4019 | $7^{h}\ 54^{m}\cdot4$ | $-47^{\circ}\ 37'$ |
| 1894·9 | $10^{\circ}\pm\ 71''$ | 6 and 7 | One third of the way |

from R Puppis towards γ Argûs.

*Sydney, N.S.W.:*
1894 *December* 10.

*Note from author dated* 1895 *January* 25.—"I find that No. 2 was measured by Mr. Sellors in 1891 (see *Ast. Nach.* No. 3154); also that Nos. 21 and 24 were observed on the meridian some years ago at Cordoba, and the *Comes* noted at the same time. Consequently these three stars are not new."

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## *The Transit of Mercury,* 1894 *November* 10. By Walter F. Gale.

The transit of *Mercury*, so far as it was visible in New South Wales, was well seen by eight observers in Sydney.

At the time of egress definition was noted by me as very good. My internal contact was probably early, but the more difficult external contact was recorded as exceptionally satisfactory. The following times were registered by counting the beats of the sidereal chronometer, which was previously and subsequently verified:

| | h | m | s | |
|---|---|---|---|---|
| Internal contact at egress, Nov. 10 ... | 9 | 11 | 30·8 | G.M.T. |
| External ,, ,, ,, ... | 9 | 13 | 23 | ,, |

My position is $10^{h}\ 4^{m}\ 54^{s}\cdot79$ E. $-33^{\circ}\ 53'\ 12''\cdot3$.

*Mercury* appeared as an intensely black circular object, without fringe or detail of any kind. The umbra of a Sun-